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CERTIFICATE OF MAILING BY "EXPRESS MAIL"

Attorney Docket No.	:	CANNING.001A
Applicant(s)	:	Francis X. Canning
For	:	COMPRESSION AND COMPRESSED INVERSION OF THE INTERACTION DATA
Attorney	:	Lee W. Henderson Ph.D.
"Express Mail" Label No.	:	EV 718246017 US
Date of Deposit	:	September 15, 2005

I hereby certify that the accompanying

Request for Continued Examination; Copy of Amendment in 20 pages; Check for Filing Fee(s); Return Prepaid Postcard

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	Francis X. Canning
Appl. No.	:	09/676,727
Filed	:	September 29, 2000
For	:	COMPRESSION AND COMPRESSED INVERSION OF INTERACTION DATA
Examiner	:	Herng Der Day
Group Art Unit	:	2128

CERTIFICATE OF MAILING

I hereby certify that this correspondence and all marked attachments are being deposited with the United States Postal Service via Express mail in an envelope labeled EV 307967471 US addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on

August 16, 2005
(Date)

Lee W. Henderson, Ph.D., Reg. No. 41,830

AMENDMENT IN RESPONSE TO THE JUNE 16, 2005 FINAL OFFICE ACTION

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Office Action mailed June 16, 2005, Applicants respectfully submit the following amendments and comments in connection with the above-captioned application.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Amendments to the Specification begin on page 11 of this paper.

A **Summary of Interview** begins on page 13 of this paper.

Remarks/Arguments begin on page 14 of this paper.

AMENDMENTS TO THE CLAIMS

IN THE CLAIMS:

A complete set of claims is provided below.

Please amend Claims 1, 10, 23, 27, and 28 as indicated below.

Please add new Claims 34 to 51 as shown below.

1. (Currently Amended) A method of data compression, comprising:

partitioning a first set of basis functions into groups, each group corresponding to a region, each basis function corresponding to one unknown in a system of linear equations, each of said basis functions corresponding to an original source;

selecting a plurality of spherical angles;

using a computer system, calculating a far-field disturbance produced by each of said basis functions in a first group for each of said spherical angles to produce a matrix of transmitted disturbances;

reducing a rank of said matrix of transmitted disturbances to yield a second set of basis functions, said second set of basis functions corresponding to composite sources, each of said composite sources comprising a linear combination of ~~one or more~~ **a number N** of said original basis functions;

partitioning a first set of weighting functions into groups, each group corresponding to one of said regions, each weighting function corresponding to a condition, each of said weighting functions corresponding to an original tester;

using a computer system, calculating a far-field disturbance received by each of said testers in a first group for each of said spherical angles to produce a matrix of received disturbances;

reducing a rank of said matrix of received disturbances to yield a second set of weighting functions, said second set of weighting functions corresponding to composite testers, each of said composite testers comprising a linear combination of ~~one or more~~ **a number M** of said original testers**, wherein at least one of either M or N is greater than one**; and

transforming said system of linear equations to use said composite sources and said composite testers.

2. (Previously Presented) A method of data compression, comprising:

partitioning a first set of basis functions into groups, each group corresponding to a region, each basis function corresponding to an unknown in a system of equations, each of said basis functions corresponding to an original source;

selecting a first plurality of angular directions;

using a computer system, calculating a disturbance produced by each of said basis functions in a first group for each of said angular directions to produce a matrix of disturbances;

using said matrix of disturbances to compute a second set of basis functions, said second set of basis functions corresponding to composite sources, wherein at least one of said composite sources produces a relatively weak disturbance from a portion of space around said at least one composite source;

partitioning a first set of weighting functions into groups, each group corresponding one of said regions, each weighting function corresponding to a condition, each of said weighting functions corresponding to an original tester;

using a computer system, calculating a disturbance received by each of said testers in a second plurality of angular directions to produce a matrix of received disturbances;

using said matrix of received disturbances to compute a second set of weighting functions, said second set of weighting functions corresponding to composite testers, wherein at least one of said composite testers weakly receives disturbances from a portion of space relative to said at least one composite tester; and

transforming at least a portion of said system of equations to use one or more of said composite sources and one or more of said composite testers.

3. (Original) The method of Claim 2, wherein said matrix of disturbances is a moment method matrix.

4. (Original) The method of Claim 2, wherein said step of using said matrix of disturbances to compute a second set of basis functions comprises reducing a rank of said matrix of disturbances.

5. (Original) The method of Claim 2, wherein said step of using said matrix of received disturbances to compute a second set of weighting functions comprises reducing a rank of said matrix of received disturbances.

6. (Original) The method of Claim 2, wherein said disturbance is at least one of an electromagnetic field, a heat flux, an electric field, a magnetic field, a vector potential, a pressure, a sound wave, a particle flux, a weak nuclear force, a strong nuclear force, and a gravity force.

7. (Original) The method of Claim 2, wherein said first plurality of directions is substantially the same as said second plurality of directions.

8. (Original) The method of Claim 2, wherein said regions of space around said at least one composite source are far-field regions.

9. (Original) The method of Claim 2, wherein said at least a portion of a region around said at least one composite tester is a far-field region.

10. (Currently Amended) A method of data compression, comprising:

calculating one or more composite sources as a linear combination of ~~**one or more**~~ **more than one** basis functions, wherein at least one of said composite sources produces a relatively weak disturbance in a portion of space related to said at least one composite source;

using a computer system, calculating one or more composite testers as a linear combination of ~~**one or more**~~ **more than one** weighting functions, wherein at least one of said composite testers is affected relatively weakly by disturbances propagating from a portion of space around said at least one composite tester; and

transforming at least a portion of a first system of equations based on said basis functions and said weighting functions into a second system of equations based on said composite sources and said composite testers.

11. (Original) The method of Claim 10, wherein said disturbance is at least one of, an electromagnetic field, a heat flux, an electric field, a magnetic field, vector potential, a pressure, a sound wave, a particle flux, a weak nuclear force, strong nuclear force, and a gravity force.

12. (Previously Presented) The method of Claim 10, wherein said composite sources comprise electric currents.

13. (Original) The method of Claim 10, wherein said composite sources comprise magnetic currents.

14. (Original) The method of Claim 10, wherein said composite sources comprise acoustic sources.

15. (Original) The method of Claim 10, wherein said composite sources comprise electromagnetic sources.

16. (Original) The method of Claim 10, wherein said composite sources comprise thermal sources.

17. (Original) The method of Claim 10, wherein each of said composite sources corresponds to a region.

18. (Original) The method of Claim 10, wherein said second system of equations is described by a sparse block diagonal matrix.

19. (Original) The method of Claim 18, further comprising the step of reordering said sparse block diagonal matrix to shift relatively larger entries in said matrix towards a desired corner of said matrix.

20. (Original) The method of Claim 10, further comprising the step of solving said second system of equations.

21. (Original) The method of Claim 10, further comprising the step of solving said second system of equations to produce a first solution vector, said first solution vector expressed in terms of said composite testers.

22. (Original) The method of Claim 21, further comprising the step of transforming said first solution vector into a second solution vector, said second solution vector expressed in terms of said weighting functions.

23. (Currently Amended) A method, comprising:

calculating at least one composite source, said composite source representing a **combination of *N*** energy sources;

using a computer system, calculating at least one composite tester **as a combination of *M* testers, where at least one of either *N* or *M* is greater than one, said at least one composite tester testing an effect produced by said at least one composite source, said at least one composite source interacting relatively weakly with said at least one composite tester**; and

transforming at least a portion of a first system of linear equations into a second system of linear equations based at least on said at least one composite source and said at least one composite tester.

24. (Original) The method of Claim 23, wherein said at least one composite source represents a linear combination of one or more energy sources such that said at least one composite source radiates relatively little energy into a portion of angular region disposed about said at least one source.

25. (Original) The method of Claim 23, wherein said at least one composite tester is affected relatively weakly by energy propagating from a portion of space around said at least one composite tester.

26. (Original) The method of Claim 23, wherein said second system of linear equations is represented by a block sparse matrix.

27. (Currently Amended) An apparatus comprising:

means for calculating at least one composite source **by combining *N* sources**;

means for calculating at least one composite tester **by combining *M* testers, where at least *N* or *M* is greater than one**; and

means for transforming at least a portion of a first system of equations into a second system of equations based at least on said at least one composite source and said at least one composite tester**, said at least one composite tester testing an effect produced by said at least one composite source, said at least one composite source interacting relatively weakly with said at least one composite tester**.

28. (Currently Amended) A method of data compression, comprising:

calculating one or more composite sources as a combination of *N* basis functions, wherein at least one of said composite sources produces a relatively weak product in a portion of space;

using a computer system, calculating one or more composite testers as a combination of ~~one or more~~ ***M*** weighting functions, wherein at least one of said composite testers interacts relatively weakly with said at least one composite **source, and wherein either *N* or *M* is greater than one**; and

transforming at least a portion of a first array of interaction data based on said basis functions and said weighting functions into a second array of interaction data based on said composite sources and said composite testers.

29. (Original) The method of Claim 28, wherein said disturbance is at least one of, an electromagnetic field, a heat flux, an electric field, a magnetic field, vector potential, a pressure, a sound wave, a particle flux, a weak nuclear force, strong nuclear force, a gravity force, and an image element.

30. (Original) The method of Claim 28, wherein each of said composite sources corresponds to a region.

31. (Original) The method of Claim 28, wherein said second array of interaction data is described by a sparse block diagonal matrix.

32. (Original) The method of Claim 28, further comprising the step of using said second array of interaction data to compute a first solution vector, said first solution vector expressed in terms of said composite testers.

33. (Original) The method of Claim 32, further comprising the step of transforming said first solution vector into a second solution vector, said second solution vector expressed in terms of said weighting functions.

34. (New) The method of Claim 1, wherein said transforming said system of linear equations produces a substantially sparse system of linear equations.

35. (New) The method of Claim 1, wherein N is greater than one and M is greater than one.

36. (New) The method of Claim 35, wherein said transforming said system of linear equations produces a substantially sparse system of linear equations.

37. (New) The method of Claim 36, wherein said matrix of transmitted disturbances is substantially different from said matrix of received disturbances.

38. (New) The method of Claim 36, wherein said matrix of transmitted disturbances is a rectangular matrix having a different number of rows and columns, and wherein said matrix of received disturbances is substantially similar to a transpose of said matrix of received disturbances.

39. (New) The method of Claim 36, wherein said matrix of transmitted disturbances is a rectangular matrix having a different number of rows and columns, and wherein said composite sources are substantially similar to said composite testers.

40. (New) The method of Claim 1, wherein said matrix of received disturbances comprises a moment-method matrix.

41. (New) The method of Claim 1, wherein said matrix of transmitted disturbances comprises a moment-method matrix.

42. (New) The method of Claim 2, wherein said matrix of received disturbances comprises a moment-method matrix.

43. (New) The method of Claim 2, wherein said transforming at least a portion of said system of equations to use one or more of said composite sources and one or more of said composite testers comprises transforming substantially all of said system of equations to use one or more of said composite sources and one or more of said composite testers.

44. (New) The method of Claim 43, wherein said transforming substantially all of said system of equations produces substantial sparseness.

45. (New) The method of Claim 2, wherein said relatively weak disturbance from a portion of space around said at least one composite source comprises a relatively weak disturbance from a far-field portion of space.

46. (New) The method of Claim 2, wherein said relatively weak disturbance from a portion of space around said at least one composite source comprises a portion of space at distances relatively shorter than a distance to other physical regions.

47. (New) The method of Claim 46, wherein said portion of space at distances relatively shorter than a distance to other physical regions comprises a relatively more dense portion of space.

48. (New) The method of Claim 2, wherein said relatively weak disturbance from a portion of space around said at least one composite source comprises a portion of space comprising substantially all angular directions in said first plurality of angular directions.

49. (New) The method of Claim 48, wherein said portion of space comprising substantially all angular directions in said first plurality of angular directions comprises a relatively more dense portion of space.

50. (New) The method of Claim 10, wherein said transforming at least a portion of a first system of equations comprises transforming substantially all of a first system of equations based on said basis functions and said weighting functions into a second system of equations based on said composite sources and said composite testers.

51. (New) The method of Claim 50, wherein said second system of equations is substantially sparse.

AMENDMENTS TO THE SPECIFICATION

In the specification, please amend the paragraph starting on line 12 of page 8 as follows:

Rather than selecting three specific locations for $E(\overline{R})$, it is known that the accuracy of the solution is often improved by integrating known values of $E(\overline{R})$ using a weighting function over the region of integration. For example, assuming that $E(\overline{R})$ is known along the surface of the wire 100, then choosing three weighting functions $g_1(\ell)$, $g_2(\ell)$, and ~~$g_2(\ell)$~~ $g_3(\ell)$, the desired three equations in three unknowns can be written as follows (by multiplying both sides of the equation by $g_i(\ell)$ and integrating):

$$\int E(\ell')g_1(\ell')d\ell' = I_1 \int\int f_1(\ell)g_1(\ell')G(\ell,\ell')d\ell d\ell' + I_2 \int\int f_2(\ell)g_1(\ell')G(\ell,\ell')d\ell d\ell' + I_3 \int\int f_3(\ell)g_1(\ell')G(\ell,\ell')d\ell d\ell'$$

$$\int E(\ell')g_2(\ell')d\ell' = I_1 \int\int f_1(\ell)g_2(\ell')G(\ell,\ell')d\ell d\ell' + I_2 \int\int f_2(\ell)g_2(\ell')G(\ell,\ell')d\ell d\ell' + I_3 \int\int f_3(\ell)g_2(\ell')G(\ell,\ell')d\ell d\ell'$$

$$\int E(\ell')g_3(\ell')d\ell' = I_1 \int\int f_1(\ell)g_3(\ell')G(\ell,\ell')d\ell d\ell' + I_2 \int\int f_2(\ell)g_3(\ell')G(\ell,\ell')d\ell d\ell' + I_3 \int\int f_3(\ell)g_3(\ell')G(\ell,\ell')d\ell d\ell'$$

Note that the above double-integral equations reduce to the single-integral forms if the weighting functions $g_i(\ell)$ are replaced with delta functions.

Please amend the paragraph at line 10 on page 9 as follows:

$$\cancel{Z_{ij} = \int\int f_j(\ell)g_i(\ell')G(\ell,\ell')d\ell d\ell}$$

$$Z_{ij} = \int\int f_j(\ell)g_i(\ell')G(\ell,\ell')d\ell d\ell'$$

Please amend the paragraph beginning at line 12 on page 9 as follows:

Solving the matrix equation yields the values of I_1, I_2, and I_3. The values I_1, I_2, and I_3 can then be inserted into the equation $\cancel{I(\ell) \approx I_1 f(\ell) + I_2 f_2(\ell) + I_3 f_3(\ell)}$ $I(\ell) \approx I_1 f_1(\ell) + I_2 f_2(\ell) + I_3 f_3(\ell)$ to give an approximation for $I(\ell)$. If the basis functions are triangular functions as shown in Figure 1B, then the resulting approximation for $I(\ell)$ is a piecewise linear approximation as shown in Figure 1C. The I_i are the unknowns and the V_i are the conditions (typically, the V_i are knowns). Often there are the same number of conditions as unknowns. In other cases, there are more conditions than unknowns or less conditions than unknown.

SUMMARY OF INTERVIEW

The Applicant submits herewith a Statement of the Substance of the Examiner Interview held via telephone on August 10, 2005.

Exhibits and/or Demonstrations

None

Identification of Claims Discussed

Claim 1 was discussed.

Identification of Prior Art Discussed

The *Rockwell* reference cited by the Examiner was discussed.

Proposed Amendments

Applicant proposed to amend Claim 1 to clarify that at least one of the composite sources or testers is a combination of two or more original sources or testers.

Principal Arguments and Other Matters

Applicant discussed the Examiner's comments in paragraph 8-6 of the Final Office Action. Applicant also reiterated the arguments presented in the response to the first Office Action.

REMARKS

The foregoing amendments are responsive to the June 16, 2005 Final Office Action. Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and the following remarks.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Response to Request for Information

The Examiner requested a copy of the "SuperNEC: Parallel MOM USER Reference Manual," Version 1.00, Poynting Software Ltd., September 21, 1999. A copy of the requested document is provided herewith in connection with an Information Disclosure Statement.

Objection to the Specification

Applicant has amended typographical errors identified by the Examiner on pages 8 and 9 of the specification. These amendments correct typographical errors and do not add new matter.

Response to Rejection of Claims 1-33 Under 35 U.S.C. 102(b)

The Examiner rejected Claims 1-33 under 35 US.C. 102(b) as being anticipated by *Rockwell*. Specifically, the Examiner argues that a composite source or tester could be a linear combination of one original source or one original tester and thus not distinguishable from the original source or tester. Applicant has amended the claims to clarify that at least one of the composite sources or testers is a combination of two or more original sources or testers.

Rockwell teaches using a known prior-art technique of employing a single SVD rank reduction on a rectangular array of data to compress the array. It was known previously that composite sources and composite testers that are created by a single SVD applied to a given rectangular array of data can then be used to compress that same array of data.

The present application teaches that one can use a first rank reduction on a first set of data to obtain composite sources, and a second rank reduction on a second (and different) set of data to obtain composite testers, and then use these separately-computed composite sources and composite testers together to compress a third set of data. The third set of data is not identical to at least one of the first and second sets of data.

For example, the first set of data may be a matrix describing the far-field effect of each source at various angles and the second set of data may be a different matrix describing the reception of each tester from various angles. In this example, the first and second data are obtained separately from physical principles rather than applications of linear algebra and thus, it is not obvious that rank reductions of the first and second matrices could be used to compress a third matrix.

Regarding Claim 1, *Rockwell* does not teach or suggest partitioning a first set of basis functions into groups, each group corresponding to a region, each basis function corresponding to one unknown in a system of linear equations, each of the basis functions corresponding to an original source, selecting a plurality of spherical angles, using a computer system, calculating a far-field disturbance produced by each of the basis functions in a first group for each of the spherical angles to produce a matrix of transmitted disturbances, reducing a rank of the matrix of transmitted disturbances to yield a second set of basis functions, the second set of basis functions corresponding to composite sources, each of the composite sources comprising a linear combination of N of the original basis functions, partitioning a first set of weighting functions into groups, each group corresponding to one of the regions, each weighting function corresponding to a condition, each of the weighting functions corresponding to an original tester, using a computer system, calculating a far-field disturbance received by each of the testers in a first group for each of the spherical angles to produce a matrix of received disturbances, reducing a rank of the matrix of received disturbances to yield a second set of weighting functions, the second set of weighting functions corresponding to composite testers, each of the composite testers comprising a linear combination of M of the original testers, wherein at least one of M or N is greater than one, and transforming the system of linear equations to use the composite sources and the composite testers.

Regarding Claim 2, *Rockwell* does not teach or suggest partitioning a first set of basis functions into groups, each group corresponding to a region, each basis function corresponding to an unknown in a system of equations, each of the basis functions corresponding to an original source, selecting a first plurality of angular directions, calculating a disturbance produced by each of the basis functions in a first group for each of the angular directions to produce a matrix of disturbances, using the matrix of disturbances to compute a second set of basis functions, the second set of basis functions corresponding to composite sources, wherein at least one of the

composite sources produces a relatively weak disturbance from a portion of space around the at least one composite source, partitioning a first set of weighting functions into groups, each group corresponding one of the regions, each weighting function corresponding to a condition, each of the weighting functions corresponding to an original tester, calculating a disturbance received by each of the testers in a second plurality of angular directions to produce a matrix of received disturbances, using the matrix of received disturbances to compute a second set of weighting functions, the second set of weighting functions corresponding to composite testers, wherein at least one of the composite testers weakly receives disturbances from a portion of space relative to the at least one composite tester, and transforming at least a portion of the system of equations to use one or more of the composite sources and one or more of the composite testers.

Regarding Claim 3, *Rockwell* does not teach or suggest the method of Claim 2, wherein the matrix of disturbances is a moment method matrix.

Regarding Claim 4, *Rockwell* does not teach or suggest that using the matrix of disturbances from Claim 2 to compute a second set of basis functions comprises reducing a rank of the matrix of disturbances.

Regarding Claim 5, *Rockwell* does not teach or suggest that using the matrix of received disturbances from Claim 2 to compute a second set of weighting functions comprises reducing a rank of the matrix of received disturbances.

Regarding Claim 6, *Rockwell* does not teach or suggest that the disturbance of Claim 2 is at least one of an electromagnetic field, a heat flux, an electric field, a magnetic field, a vector potential, a pressure, a sound wave, a particle flux, a weak nuclear force, a strong nuclear force, and a gravity force.

Regarding Claim 7, *Rockwell* does not teach or suggest that first plurality of directions in Claim 2 is substantially the same as the second plurality of directions.

Regarding Claim 8, *Rockwell* does not teach or suggest that the regions of space around the at least one composite source in Claim 2 are far-field regions.

Regarding Claim 9, *Rockwell* does not teach or suggest that the at least a portion of a region around the at least one composite tester in Claim 2 is a far-field region.

Regarding Claim 10, *Rockwell* does not teach or suggest calculating one or more composite sources as a linear combination of M basis functions, wherein at least one of the composite sources produces a relatively weak disturbance in a portion of space related to the at

least one composite source, calculating one or more composite testers as a linear combination of *N* weighting functions, wherein at least one of the composite testers is affected relatively weakly by disturbances propagating from a portion of space around the at least one composite tester, where at least one of *N* or *M* is not one, and transforming at least a portion of a first system of equations based on the basis functions and the weighting functions into a second system of equations based on the composite sources and the composite testers.

Regarding Claim 11, *Rockwell* does not teach or suggest the method of Claim 10, wherein the disturbance is at least one of, an electromagnetic field, a heat flux, an electric field, a magnetic field, vector potential, a pressure, a sound wave, a particle flux, a weak nuclear force, strong nuclear force, and a gravity force.

Regarding Claim 12, *Rockwell* does not teach or suggest the method of Claim 10, wherein the composite sources comprise electric currents.

Regarding Claim 13, *Rockwell* does not teach or suggest the method of Claim 10, wherein the composite sources comprise magnetic currents.

Regarding Claim 14, *Rockwell* does not teach or suggest the method of Claim 10, wherein the composite sources comprise acoustic sources.

Regarding Claim 15, *Rockwell* does not teach or suggest the method of Claim 10, wherein the composite sources comprise electromagnetic sources.

Regarding Claim 16, *Rockwell* does not teach or suggest the method of Claim 10, wherein the composite sources comprise thermal sources.

Regarding Claim 17, *Rockwell* does not teach or suggest the method of Claim 10, wherein each of the composite sources corresponds to a region.

Regarding Claim 18, *Rockwell* does not teach or suggest the method of Claim 10, wherein the second system of equations is described by a sparse block diagonal matrix.

Regarding Claim 19, *Rockwell* does not teach or suggest the method of Claim 18, further comprising the step of reordering the sparse block diagonal matrix to shift relatively larger entries in the matrix towards a desired corner of the matrix.

Regarding Claim 20, *Rockwell* does not teach or suggest the method of Claim 10, further comprising the step of solving the second system of equations.

Regarding Claim 21, *Rockwell* does not teach or suggest the method of Claim 10, further comprising the step of solving the second system of equations to produce a first solution vector, the first solution vector expressed in terms of the composite testers.

Regarding Claim 22, *Rockwell* does not teach or suggest the method of Claim 21, further comprising the step of transforming the first solution vector into a second solution vector, the second solution vector expressed in terms of the weighting functions.

Regarding Claim 23, *Rockwell* does not teach or suggest calculating at least one composite source, the composite source representing a combination of N energy sources, using a computer system, calculating at least one composite tester as a combination of M testers, where at least one of N or M is greater than one, the at least one composite tester testing an effect produced by the at least one composite source, the at least one composite source interacting relatively weakly with the a t least one composite tester, and transforming at least a portion of a first system of linear equations into a second system of linear equations based at least on the at least one composite source and the at least one composite tester.

Regarding Claim 24, *Rockwell* does not teach or suggest the method of Claim 23, wherein the at least one composite source represents a linear combination of one or more energy sources such that the at least one composite source radiates relatively little energy into a portion of angular region disposed about the at least one source.

Regarding Claim 25, *Rockwell* does not teach or suggest the method of Claim 23, wherein the at least one composite tester is affected relatively weakly by energy propagating from a portion of space around the at least one composite tester.

Regarding Claim 26, *Rockwell* does not teach or suggest the method of Claim 23, wherein the second system of linear equations is represented by a block sparse matrix.

Regarding Claim 27, *Rockwell* does not teach or suggest means for calculating at least one composite source by combining N sources, means for calculating at least one composite tester by combining M testers, where at least N or M is greater than one, and means for transforming at least a portion of a first system of equations into a second system of equations based at least on the at least one composite source and the at least one composite tester the at least one composite tester testing an effect produced by the at least one composite source, the at least one composite source interacting relatively weakly with the a t least one composite tester.

Regarding Claim 28, *Rockwell* does not teach or suggest calculating a group of N composite sources as a combination of one or more basis functions, wherein at least one of the composite sources produces a relatively weak product in a portion of space, using a computer system, calculating one or more composite testers as a combination of a group of M weighting functions, wherein at least one of the composite testers interacts relatively weakly with the at least one composite tester and wherein either N or M is greater than one, and transforming at least a portion of a first array of interaction data based on the basis functions and the weighting functions into a second array of interaction data based on the composite sources and the composite testers.

Regarding Claim 29, *Rockwell* does not teach or suggest the method of Claim 28, wherein the disturbance is at least one of, an electromagnetic field, a heat flux, an electric field, a magnetic field, vector potential, a pressure, a sound wave, a particle flux, a weak nuclear force, strong nuclear force, a gravity force, and an image element.

Regarding Claim 30, *Rockwell* does not teach or suggest the method of Claim 28, wherein each of the composite sources corresponds to a region.

Regarding Claim 31, *Rockwell* does not teach or suggest the method of Claim 28, wherein the second array of interaction data is described by a sparse block diagonal matrix.

Regarding Claim 32, *Rockwell* does not teach or suggest the method of Claim 28, further comprising the step of using the second array of interaction data to compute a first solution vector, the first solution vector expressed in terms of the composite testers.

Regarding Claim 33, *Rockwell* does not teach or suggest the method of Claim 32, further comprising the step of transforming the first solution vector into a second solution vector, the second solution vector expressed in terms of the weighting functions.

Accordingly, Applicant asserts that Claims 1-33 are in condition for allowance, and Applicant requests allowance of Claims 1-33.

New Dependent Claims 34-51

Applicant has added additional dependent claims 34-51. Claims 34-41 depend (directly or indirectly) from Claim 1. Claims 42-49 depend (directly or indirectly) from Claim 2. Claims 50 and 51 depend (directly or indirectly) from Claim 10. Claims 34-51 recite features and aspects fully supported by the specification and do not add any new matter.

Applicant asserts that Claims 34-51 are allowable over the prior art, and Applicants request allowance of Claims 34-51.

Summary

Applicants respectfully assert that Claims 1-51 are in condition for allowance, and Applicants request allowance of Claims 1-51. If there are any remaining issues that can be resolved by a telephone conference, the Examiner is invited to call the undersigned attorney at (949) 721-6305 or at the number listed below.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: August 16, 2005

By: Lee W. Henderson

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